

B. Claims

Please replace all of the claims in the application with the following complete set of claims.

1. (Currently amended) A braking system monitoring apparatus for monitoring system pressure in a braking system, comprising:
an accumulator providing a supply of hydraulic braking fluid to the braking system for use in applying a brake, the accumulator having an accumulator charge pressure;
a at least one pressure detection device for measuring system which measures the pressure of the hydraulic braking fluid in the accumulator and responsively producing an output signal; and
a at least one monitoring device for receiving said which receives the output signal and sampling said output signal at pre-determined intervals continually during operation of the vehicle; and
the monitoring device being capable of using the output signal to determine the accumulator charge pressure, comparing the accumulator charge pressure to a pressure limit, and using the results of the comparison in generating a fault signal.

2-9. (Cancelled)

10. (Currently amended) A method of monitoring hydraulic braking fluid system pressure in a braking system of a vehicle, the braking system including an accumulator, the method comprising the steps of:
measuring the pressure of the hydraulic braking fluid system pressure and responsively producing an output signal; and
monitoring said output signal and sampling said output signal at pre-determined intervals continually during operation of the vehicle.
processing the output signal to estimate an accumulator charge pressure; and

comparing the estimate of the accumulator charge pressure with an ideal value.

11-14. (Cancelled)

15. (New) The braking system of claim 1 wherein the monitoring device records the pressure of the hydraulic braking fluid in the accumulator within a fixed amount of time after a braking system start-up is detected to determine the accumulator charge pressure.

16. (New) The braking system of claim 15 wherein the monitoring device is further capable of determining a cut-in pressure of the braking system and comparing the cut-in pressure to a cut-in pressure limit, the monitoring device using this comparison in generating a fault signal.

17. (New) The method of claim 10 wherein comparing the estimate of the accumulator charge pressure with an ideal value further comprises:
calculating a difference between the estimate of the accumulator charge pressure and the ideal value to produce an error value.

18. (New) The method of claim 17 further comprising:
comparing the error value to a preset limit value and using that comparison to determine whether a fault signal should be generated.

19. (New) The method of claim 10 wherein processing the output signal to estimate an accumulator charge pressure further comprises comparing several hydraulic braking fluid pressures and determining which one is the best estimate of the accumulator charge pressure.

20. (New) The method of claim 19 wherein processing the output signal to estimate an accumulator charge pressure further comprises sampling each of the several hydraulic braking fluid pressures at predetermined times after a braking system start-up is detected.

21. (New) A braking system comprising:

an accumulator providing a supply of pressurized hydraulic braking fluid to the braking system for use in applying a brake, the accumulator comprising at least a first chamber for hydraulic braking fluid which has a first volume when the hydraulic braking fluid is less than a first pressure, and which expands to a volume greater than the first volume when the hydraulic braking fluid is greater than the first pressure;

a pump which when actuated provides pressurized hydraulic braking fluid to the first chamber of the accumulator;

a pressure detection device which measures the pressure of the hydraulic braking fluid in the first chamber of the accumulator and responsively producing an output signal;

a monitoring device which receives the output signal of the pressure detection device, wherein the monitoring device identifies an estimate of the first pressure of the hydraulic braking fluid, and uses the estimate of the first pressure in determining whether to produce a fault signal.

22. (New) The braking system of claim 21 wherein the monitoring device identifies the estimate of the first pressure by recording the pressure of the hydraulic braking fluid in the first chamber of the accumulator at a time immediately after the first chamber expands beyond the first volume.

23. (New) The braking system of claim 21 wherein the monitoring device identifies the estimate of the first pressure by recording several pressures of the hydraulic braking fluid in the first chamber of the accumulator within a predetermined time after a braking system start-up is detected.

24. (New) The braking system of claim 23 wherein the monitoring device selects one of the several pressures to be the first hydraulic braking fluid pressure.

25. (New) A braking system comprising:

an accumulator providing a supply of pressurized hydraulic braking fluid to the braking system for use in applying a brake, the accumulator comprising at least a first chamber for hydraulic braking fluid which has a first volume when the hydraulic braking fluid is less than a first pressure, and which expands to a volume greater than the first volume when the hydraulic braking fluid is greater than the first pressure, the accumulator further comprising a second volume having a pressurized precharge gas, the second volume also having a cooperative relation with the first volume whereby the second volume contracts when the first volume expands, and the second volume expands when the first volume contracts;

a pump which when actuated provides pressurized hydraulic braking fluid to the first chamber of the accumulator;

a pressure detection device which measures one of the pressure of the hydraulic braking fluid in the first chamber of the accumulator or the pressure of the precharge gas in the second chamber of the accumulator, and responsively producing an output signal;

a monitoring device for receiving the output signal of the pressure detection device, wherein the monitoring device samples one of the pressure of the hydraulic braking fluid in the first chamber of the accumulator, or the pressure of the precharge gas in the second chamber of the accumulator, in response to a detection of a braking system start-up, and uses the one of the sample of the hydraulic braking fluid pressure or the precharge gas pressure in determining whether to produce a fault signal.

26. (New) The braking system of claim 25 further comprising a pressure sensitive valve in communication with the pump and the accumulator having a cut-in pressure and a cut-out pressure, the valve opening to permit pressurized hydraulic braking

fluid to flow from the pump to the accumulator when the pressure of the hydraulic braking fluid in the first chamber of the accumulator falls below the cut-in pressure, and the valve closing to prevent pressurized hydraulic braking fluid from flowing from the pump to the accumulator when the pressure of the hydraulic braking fluid in the first chamber of the accumulator rises above the cut-out pressure.

27. (New) The braking system of claim 26 wherein the monitoring device identifies the cut-in pressure and the cut-out pressure of the valve by monitoring one of the pressure of the hydraulic braking fluid in the first chamber of the accumulator or the pressure of the precharge gas in the second chamber of the accumulator.